Light is Energy

Light is the only form of energy that is needed to see the surroundings.

Light: is a visible form of energy travel as **light waves**.

To see objects (vision): light must **fall on** object and **reflected** (**bounce off**) into the eyes.

Nervous system has important role in vision:
as **the eyes** send information to the **brain** for **processing** to see objects.

- We can see objects **clearly** in **bright light** than **dim light**.
- We can't see objects in dark in **absence of light**.

Special eye structure of some animals:

Deers, horses, cats and dogs: use eyesight membrane called " **Tapetum lucidum** "

Tapetum lucidum: A **mirror-like** membrane **reflects** light make eyes **glows** at night.

Tapetum lucidum: A **thin reflective** layer at back of animal's eyes help in night vision.

Tapetum lucidum: The life-saving **structural adaptation** gives animal extra **night vision**.

How Tapetum lucidum works:
It reflects light like a mirror to allow eyes to collect more little light.

- Cats use **Tapetum lucidum** to hunt at night by **light waves** (sight sense).
- Bats use **Echolocation property** to hunt at night by **sound waves** (hearing sense).

In complete darkness animals use **hearing, touching, tasting and smell sense** to hunt.

Eye pupil: Opening inside eye allows light waves enter the eyes.

Reflection of light

Interaction of light with different type materials:

Shiny and smooth materials: reflect **most** light such as **mirror and metal**.

Rough materials: reflect **small** amount of light such as **plastic, wood, cloth and paper**.

Transparent materials: reflect **very small** amount of light such as **glass**.

Light: is a form of energy travels in **straight lines**.

Light: like **sound** travel in the form of **waves**.

- We see objects as a result of the **reflected** light rays on our eyes.

Opaque objects: Objects don't allow light to pass through (**light can't pass through**).

Examples of opaque objects: plastic – wood – metal – human body.

- Things **can't be seen** through **opaque** objects.

Shadow: is formed by **opaque** objects as they absorb or reflect all light.

Transparent objects: Objects allow light to pass through (**light can pass through**).

Examples of transparent objects: air – water – glass window – lenses.

- Things **can be seen** through **transparent** objects.

Air: A **transparent** material that surrounds us and we **use it in breathing**.

Smooth surface: A type of surface that reflects light at the **same angle** as polished mirror.

Rough surface: A type of surface that reflects light in **different directions** as painted surface.

Rough surface: scatter or diffuse light.

How light help us to see?

Light waves **fall** on objects and **bounce off** to eyes.
Nerves of eye send message to the **brain** to interprets as image.

Vision defects

Eye pupil: Opening through which the light enters the eye.

Eye socket: It is a place in which the **eye can move inside** as in human.

Magnifying glass: A type of glass that **concentrate** light on a **single point**.

Eye lens: structure in the eye **focuses** falling light on the **back of the eye**.

- When the eye lens **doesn't** focus the light **properly** causes **vision defects (blurry vision**).

- **Vision defects** as:

  1- A person can't see **far** objects

  2- A person can't see **near** objects

  3- A person can't distinguish between **colors**.

Optometrist: A doctor who specialized in vision and eyesight.

Optometrist: A person who tests our **eyes lens** is **focusing properly or not**.

To correct the vision (Treatment of vision defects) by Optometrist:

1- Using **glasses** or **contact lenses**.
2- Using **laser surgery**.

Blindness: A person which **loses his sight completely**.

Note: Eye lens **collect (focus)** the light in a point while **tapetum lucidum reflects** the light.

- **Human eyes** have **lenses** to **focus** the light in a **point**.
- **Fishing cat eyes** seem to **glow** in dark as they have **tapetum lucidum to bounce off the light.**
- **Owl eyes** have **huge eyes** that **can't move** in their sockets.
- **Chameleon eyes** It has eyes **move in opposite directions**.

Communication and information transfer

- **Human and animals** use their **senses** to gather information about the environment.
- **Human and animals** use **light and sound** to send and receive information.
- **Human** use **speaking, writing and reading** to communicate with each other.
- **Both Human and animals** use **sound, watching, movements and display light** to communicate.
- **Animals** use **Echolocation** to communicate with each other (dolphin – bat).

- **Fireflies beetles:** use **sight sense** to communicate with each other.
- **Whales:** use **hearing sense** as **songs tones** to communicate with each other.

Fireflies beetles: A type of beetles that produce **flash light** using their **wings**.

Fireflies beetles: produce a **chemical reaction** inside their bodies to allow **light up** and communicate.

Fireflies beetles: are **winged** beetles use **wings** to **flash light** to **warn off** predators or to attract a **mate** to reproduce.

A group of fireflies: can change their own **flash pattern** to communicate with other group.

- It is possible for a human to **interact** with fireflies by they can **imitate** each other.

Alphabet and written Language

- **Human** use **speaking, writing and reading** to communicate with each other.

- Human are **separated** from animals by their ability to communicate through **language and speech.**

Ancient Egyptians	Babylonians (Iraq)	Mayans (Central America)	Chinese
Created **hieroglyphics language** of 700 symbols.	Created **cuneiform drawings.**	Created **hieroglyphs** of 800 signs.	Created a paper from **mulberry and bamboo plant.**
Created a **paper** from **papyrus** plant.			

- **Human** use **speaking, writing and reading** to communicate with each other.
- **Both Human and animals** use **sound, watching, movements and display light** to communicate.
- **Animals** use **Echolocation** to communicate with each other (dolphin – bat).

Song of Whales

- **Dolphins and whales:** use **sound energy** to communicate with each other.
- **Fireflies:** use **light energy** to communicate with each other.
- **Humans:** use **language** to communicate with each other.
- **Ear:** A sense organ that can detect **sound** energy.
- **Eye:** A sense organ that can detect **light** energy.

Humpback whales

Humpback whales: use **hearing sense**, they sing a wide range of **tones** and **songs** series.
Sound is described as:

1- **High pitched sound:** **soft** sounds such as **women voice**.
2- **Low pitched sound:** **rough** sounds such as **man voice**.

Humpback whales: use high or low pitched sounds according to the seasons:

In winter months	In summer months
The songs of humpback whales have **high-pitched sounds**	The songs of humpback whales have **low-pitched sounds**
High-pitched sounds travel better through **cold water**	Low-pitched sounds travel better through **warm water**
Songs of **mating** season.	

Transferring Information

Sense organs collect information then send it to the **brain** through **nerves** for **processing** (**decodes**).

Types (kinds) of information of eye sight sense

1- Human waving.
2- Man stops by seeing a red traffic light.
3- Using a rescue flare.
4- Using signal fires.
5- **Hikers** (travelers) use **mirrors** to attract rescue helicopters.
6- **Sailors** use light houses to tell where they are.
Note: Light travel very **fast** over distances.

Codes and Transferring Information

Code: Information that transformed into another **representative** form.

- **Human:** use **codes** to transmit information.
- **Forms of codes:**

1- **Thumbs-up code:** A code that means that you say "Yes".
2- **Thumbs-down code:** A code that means that you say "No".
3- **Faces expressions** - **Red or green traffic light**
4- **Language and music codes:** **sounds** form (tunes) use sense of **hearing** to communicate.

- Different languages have **different** codes.

5- **Writing code:** **symbols** form use sense of **sight** to communicate.

Inventing a code

- **Fireflies:** use **flashing** light patterns to communicate.
- **Humans:** designed **Morse Code** system using **sound** or **light**.

Morse Code

Morse Code: A communication system developed by **Samuel Morse** in the 19^{th} century.

Morse Code: A communication system that depend on **sound** or **light** energy.

Morse Code: A **simple** code consists of **short beeps** known as **dots** and **long beeps** known as **dashes**.

Dots: The short beeps of sound (**short flashes of light)** in Morse code.

Dashes: The long beeps of sound (**long flashes of light)** in Morse code.

Dots and dashes: represent different **letters of alphabet**.

- Using **sound** energy that depends on the sense of **hearing**.
- Using **light** energy that depends on the sense of **sight**.

To improve your code: use **simple code** - use **distinct letters**.

Animals Communicate with Movement

- **Humans and animals** use different ways to communicate as **sound – light – movement**.

Honey Bees use **movement** to communicate

Bees live in the **hive**   **Ants** live in **colonies**

Bees use a **figure-eight pattern** dance and vibrate its **wings** as a **code** to find **food** and **water**.

The scout honeybee is responsible for **searching** out **food** sources.

The scout honeybee makes **one round dance** for **near** flower.

The scout honeybee makes **one waggle dance** for **far** flower.

Honey bee makes a series of **movements** and **vibrations** with **wings** for **flower location**.

Honey bee use **codes with movements** to communicate through **sight** sense.

Humans use **movements** to communicate **such as**:

Sign Language: It used by people of **special needs**.   **Simple gestures.**

Communication Systems

System: It is a group of **related objects** that work together to perform a function.

Communication systems designed by **human** used to make communication easily.

Communication systems used to **send** and **receive** information.

Examples of communication systems: are **electronic devices** – **technology systems** such as: cell phone – computer – TV

Communication systems depend on **signals** in their work.

Electronic devices are connected with **satellites**, **communication towers** and **software** to **transfer information** in correct way.

Animals **don't use technology systems** but use other systems.

Ants live in **colonies**.

- Groups of **ants** in a colony have **different** roles.

Nurse ants send **smelly** message when the amount of food decreases.

Scout ants search and **locate food**.

Solider ants are warning and protect colony from **dangers**.

Ants use **smell** sense.   **Bees and fireflies** use **sight** sense.

Technology Inspired (get benefit) by Nature

- **Bats** use **sound** to communicate by **hearing** sense.

Bats use **ears** for **echolocation** to make **high-pitched sound** reflected from object by **echo**.

Scientists inspired by bat **echolocation** to help **blind people**.

Scientists created a **cane** with **high-pitched sound**, the reflected **echo** make **vibrations** with person **thumb** to locate objects as **bats**.

- Special cane of blind person **similar** to bats in **a high-pitched sound**.
- Special cane of blind person **different** from bats in **has vibrations.**(**bat can't make it**)
- Special cane of blind person **similar** honeybees in makes vibrations.

- **Bats** live in **caves** (**dark places**)
- **Bats** make **high-pitched sound,** So humans can't hear it.
- **Bats** feed on insects and mosquitoes.
- **Bats** make sounds about **food** or where to get **sleep**.

Revision

Science Exercises For November Syllabus

Concept 3: Light and Sight

1 Choose the correct answer:

1. The eyes of .... seem to glow in the dark.
   a. owls b. cats c. bats d. snakes
2. All the following reflect the light rays that fall on them, except ....
   a. the moon b. mirrors c. the flashlight d. metals
3. .... have poor night vision, but they are active at night.
   a. Owls b. Tarsiers c. Cats d. Snakes
4. All the following are considered sources of light, except the ....
   a. sun b. lamp c. moon d. flashlight
5. All these animals have tapetum lucidum in the back of their eyes, except ....
   a. deer b. cats c. owls d. horses
6. The human body is considered a/an .... medium.
   a. opaque b. transparent c. smooth d. rough
7. Light rays travel in the form of .... lines in the air.
   a. curved b. straight c. circular d. zigzag
8. Which is the correct sequence that represents the vision?
   a. Object ⟶ eyes ⟶ light
   b. Eyes ⟶ object ⟶ light
   c. Light ⟶ eyes ⟶ object
   d. Light ⟶ object ⟶ eyes
9. Many nocturnal animals can detect their surroundings in complete darkness using all of their senses, except ....
   a. hearing b. touch c. sight d. smell

10. A piece of cloth is considered a/an .... material.
    a. shiny b. transparent c. smooth d. rough

11. The structural adaptation in the pupils of the eyes of nocturnal animals ....
    a. allows less light to enter the eyes
    b. allows more light to enter the eyes
    c. doesn't allow any light to reach the eyes
    d. reflects all the light that falls on it

12. .... is considered a transparent medium.
    a. Wood b. Mirror c. Carton d. Air

13. .... and .... can't move their eyes in their sockets.
    a. Owls - snakes b. Cats - tarsiers
    c. Tarsiers - owls d. Humans – cats

14. .... can hunt easily in complete darkness.
    a. Owls b. Tarsiers c. Bats d. Cats

15. Adam can see the apple when light ....
    a. falls on his eyes and then reflects on the apple
    b. falls on the apple and then on his eyes
    c. falls on his eyes and then on the apple
    d. falls on the apple and then reflects on his eyes

16. Reflection of light requires a ....
    a. light source b. sound source
    c. reflecting surface d. a and c

17. All the following are considered rough surfaces, except ....
    a. plastic b. clothes c. mirrors d. paper

18. .... is considered a shiny medium.
    a. Glass b. Wood c. Paper d. Mirror

19. All the following are transparent mediums, except ....
    a. glass b. mirrors c. lenses d. air

20. When the light falls on an opaque object, ... is formed.
    a. rainbow b. shadow c. image d. new object

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2 Put (✓) or (✗):

1. All nocturnal animals have excellent night vision. (   )
2. Human eyes are more sensitive to light than cat eyes. (   )
3. Some nocturnal animals have poor night vision. (   )
4. The moon is considered a reflecting surface like a mirror. (   )
5. A shadow is formed when light falls on a reflecting surface. (   )
6. Cats have wide pupils to allow less amount of light to enter the eyes. (   )
7. The eye is the organ in the human body that is affected by light. (   )
8. Both owls and tarsiers can move their eyes in their sockets. (   )
9. The moon is considered a natural source of light. (   )
10. Light waves travel in the air in the form of curved lines. (   )
11. Polished mirrors scatter and diffuse light rays that fall on them. (   )
12. Hunting at night for nocturnal animals is considered a behavioral adaptation. (   )
13. The human eye can see objects because it emits its own light. (   )
14. Fishing cats have a mirror-like membranes in front of their eyes. (   )
15. Humans need night vision goggles to see objects in the darkness. (   )
16. The kind of light reflection depends on the material that the light falls on. (   )
17. The length of the tarsier is about 10 centimeters, including its tail. (   )
18. Wood, plastics, and metals are considered examples of rough materials. (   )

3 Write the scientific term:

1. Animals that are active at night and have spectacular night vision. (..................)
2. Animals that have eyes that glow in the dark as lighted points. (..................)
3. The kind of energy that helps the eyes to see objects clearly. (..................)
4. Objects that emit their own light. (..................)
5. It is the main source of light on Earth. (..................)
6. A shiny body that appears at night and reflects the sunlight that falls on it. (..................)
7. A special tool that humans use to see objects in complete darkness. (..................)
8. A kind of adaptation, in which nocturnal animals adapted to hunt at night. (..................)
9. A kind of adaptation, in which nocturnal animals use their super senses. (..................)
10. A structure inside the eye that controls the amount of light that enters the eye. (..................)
11. A structure inside the eye that reflects the light rays that fall on it. (..................)
12. A visible form of energy that travels in the form of waves in straight lines. (..................)
13. The bouncing of light rays when they fall on a reflecting surface. (..................)
14. They are materials that allow most of light that falls on them to pass. (..................)
15. They are materials that include wood and clothes. (..................)
16. They are materials that we can't see anything behind. (..................)

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17. They are materials that light rays bounce off of. (....................)
18. A dark area that is formed when light falls on an opaque object. (....................)

4 Complete the following sentences:

1. .... and .... are nocturnal animals that have poor night vision, while .... and .... have excellent night vision.
2. Light rays travel in the form of ....
3. Tapetum lucidum is considered a .... adaptation.
4. Things can't be seen behind .... materials.
5. Humans need .... to see clearly what's happening around them.
6. Polished mirrors reflect light rays in the same .... with the same ....
7. In the absence of light sources, humans can use .... to see in the dark.
8. The mirror-like membrane located on the .... of the eye of .... that reflects the light falling on it and it is considered an example of .... adaptation.
9. In complete darkness, nocturnal animals can depend another senses, such as .... and ....
10. The pupils in the human eyes allow .... amount of light to enter the eyes.
11. Rough surfaces include ...., ... and ....
12. The tarsier monkey is from .... and its length is about .... without its tail.
13. Tarsiers eat different kinds of food, such as ...., ... and ....
14. Tarsiers can't move their ...., but they can turn their .... in all directions.
15. Transparent mediums include ...., ... and ....
16. .... surfaces scatter light rays that fall on them.

5 Cross out the odd word:

1. Fishing cats – Snakes – Bats (..........)
2. Tarsiers – Cats – Snakes – Owls (..........)
3. Snakes – Bats – Owls - Humans (..........)
4. Candle – Flashlight – Moon – Electric lamp (..........)
5. Mirror – Plastic – Metal (..........)
6. Wood – Plastic – Glass (..........)
7. Water – Milk – Air (..........)
8. Light reflection – Mirror – Wood - Flashlight (..........)

6 Classify the following:

1. Owls – Fishing cats – Bats – Snakes

Excellent Night Vision	Poor Night Vision
....	....
....	....

2. Plastic – Wood – Glass – Metal – Pure water – Book – Skin – Milk - Lenses

Transparent Mediums	Opaque Mediums
....	....
....	....

3. Mirror – Wood – Glass – Metal

Shiny Surfaces	Rough Surfaces	Transparent Surfaces
....	....	....
....	....	....

7 Choose from column (A) what suits it in column (B):

1

Column (A)	Column (B)
1 Bats	a. can locate their prey in dark water.
2 Cats	b. have a thin membrane that allows them to see at night.
3 Owls	c. have the ability to sense the heat of their prey.
4 Dolphins	d. detect the sound reflected from their prey in the air.
5 Snakes	e. have that bowl-shaped faces and feathers in their heads.

1 .... 2 .... 3 .... 4 .... 5 ....

2

Column (A)	Column (B)
1 Brain	a. send messages to the brain through the nerves.
2 Nerves	b. control the light that enters the eyes.
3 Human eyes	c. reflects the light rays that fall on it.
4 Pupils	d. translates and processes information.
5 Tapetum lucidum	e. transmit messages between the brain and the eyes.

1 .... 2 .... 3 .... 4 .... 5 ....

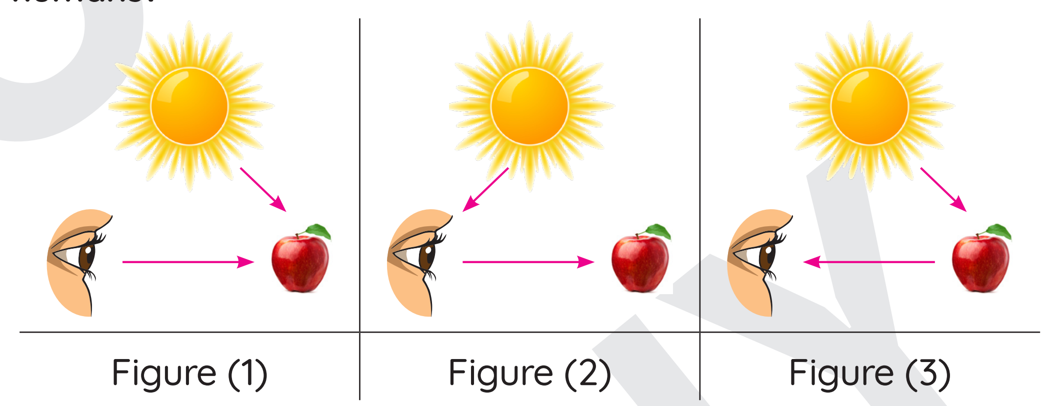
3

Column (A)	Column (B)
1 Light reflection	a. reflect light rays in one direction.
2 Sun	b. reflect light rays in different directions.
3 Shadow	c. it is the main source of energy.
4 Moon	d. it is shiny, but it isn't considered a source of energy.
5 Smooth surfaces	e. it is formed when the light strikes a human body.
6 Rough surfaces	f. it is formed when the light strikes a mirror.

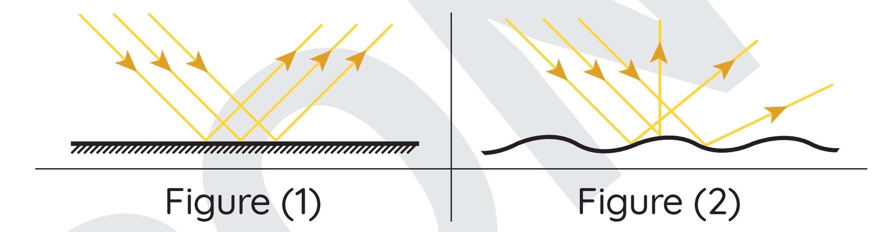
1 .... 2 .... 3 ....
4 .... 5 .... 6 ....

8 Study the following figures, then answer the questions:

1 Which of the following figures represents the correct vision in humans?



2 The following figures represent two types of light reflection:



Complete using the words between the brackets:

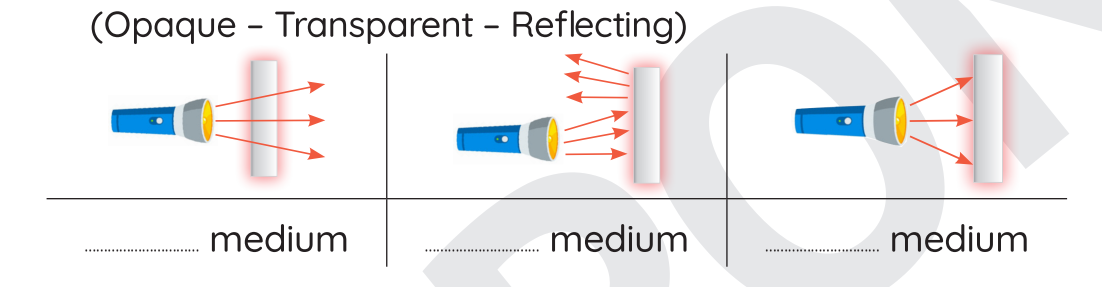
(transparent – smooth – rough – mirror – wood – glass)

a. Figure (1) represents the reflection of light from a .... surface such as ....

b. Figure (2) represents the reflection of light from a .... surface such as ....

3 The following figures represent three different mediums, complete using the following words:

(Opaque – Transparent – Reflecting)



4 **Study the following figures, then complete the sentences:**

				
Figure (1)	Figure (2)	Figure (3)	Figure (4)	Figure (5)

a. Figure (..........) can move each eye independently.

b. Figure (..........) has eyes that glow in the dark.

c. Figures (..........) and (..........) can turn their heads in all directions.

d. Figure (..........) needs night vision goggles to see in the dark.

9 Give reasons for:

1. Fishing cat's eyes seem to glow in the dark.
2. The moon is not considered a source of light.
3. Flashlight is a source of light.
4. The pupil of a nocturnal animal opens wider than a human.
5. Tapetum lucidum is a life saving structural adaptation.
6. We can see objects behind transparent materials.
7. Glass is a transparent medium.
8. Wood is an opaque medium.

10 What happens if:

1. Light falls on objects around us.
2. Light falls on a mirror.
3. Light falls on a human body.
4. Light falls on glass.

Concept 4: Communication and Information Transfer

1 Choose the correct answer:

1. Language is a code in the form of .... energy.
   a. light b. sound c. thermal d. chemical
2. .... can communicate using light codes.
   a. Whales b. Bees c. Ants d. Fireflies
3. .... is/are responsible for searching for the food resources.
   a. Nurse ants b. Scout ants c. Solider ants d. Queen ant
4. Songs of humpback whales have low-pitched sound during .... seasons.
   a. migration b. hibernation c. mating d. feeding
5. Morse code consists of short beeps known as ....
   a. dots b. dashes c. symbols d. drawings
6. Bees in their hives can detect the motion of scout bees by their .... sense.
   a. hearing b. sight c. smell d. touch
7. Bats use their strong .... sense to detect echo.
   a. sight b. smell c. hearing d. touch
8. .... is a property used by dolphins and bats to locate their prey.
   a. Countershading b. Camouflage
   c. Echolocation d. Aestivation
9. Dots and dashes in Morse code represent ....
   a. map drawing b. numbers
   c. alphabet letters d. weather

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10. Blind people use their .... sense to pick up echo through the cane.
   a. hearing b. sight c. smell d. touch

11. Morse code depends on .... energy(ies).
   a. sound b. light c. heat d. sound and light

12. Fireflies produce a .... reaction in their bodies to light up their wings.
   a. physical b. biological c. chemical d. nuclear

13. The voice of a man is rough as it has .... sound.
   a. low-pitched b. high-pitched c. sharp d. soft

14. A high-pitched sound is characterized by the fact that ....
   a. it travels better in cold water than in warm water
   b. it travels better in warm water than in cold water
   c. it travels easily in both cold and warm water
   d. it can't travel in both cold and warm water

15. Thumbs-up is a code that means you ....
   a. say no b. say yes c. are angry d. are tired

16. All the following are information received by the eyes, except ....
   a. someone waving b. red traffic
   c. light houses codes d. someone speaking

17. Morse code is a communication system that is used by ....
   a. dolphins b. fireflies c. bats d. humans

18. .... can change echo to vibrations.
   a. Bats b. Canes c. Dolphins d. Honeybees

19. Morse code consists of long beeps known as ....
   a. dots b. dashes c. symbols d. drawings

20. Honeybees live in ....
   a. colonies b. hives c. nests d. caves

21. Honeybees communicate together using ....
   a. sound patterns b. light patterns
   c. motion patterns d. their smell sense

22 Honeybees communicate together in order to ....

a. attract a mate
b. sneak on the prey
c. avoid predators
d. search for food

23 Scout bees rotate in the form of number .... to direct another bee to the direction of food.

a. 6
b. 8
c. 9
d. 0

24 All the following are ways to communicate among humans, except ....

a. writing
b. Morse code
c. reading
d. echolocation

25 Ants live in .... that are composed of thousands of individuals.

a. colonies
b. hives
c. nests
d. caves

26 Ants communicate together using ....

a. sound patterns
b. light patterns
c. motion patterns
d. their smell sense

27 Nurse ants send smelly messages to scout ants in case of ....

a. mating season
b. a danger nearby
c. lack of food
d. lack of water

28 Solider ants send smelly messages to other ants in case of ....

a. mating season
b. a danger nearby
c. lack of food
d. lack of water

29 All the following use echolocation property to locate things, except ....

a. blind people
b. bats
c. honeybees
d. dolphins

30 Both .... and .... make a series vibration to communicate.

a. bats - honeybees
b. canes - bats
c. honeybees - fireflies
d. canes - honeybees

2 Put (✓) or (✗):

1. Fireflies light up their wings to warm their bodies. ( )
2. Humans are the only living organisms that communicate using language. ( )
3. Light flashes are a code that the ear detects. ( )
4. Other bees in hives use their smell sense to locate the direction of food. ( )
5. Bees communicate together using motion patterns. ( )
6. Fireflies can communicate with each other using sound energy. ( )
7. Solider ants protect the colony from any danger nearby. ( )
8. Humpback whales change their sound pitch according to seasons. ( )
9. Men have high-pitched and rough sound. ( )
10. Special canes can help deaf people to locate things. ( )
11. A facial expression is a code that can be received by the eyes. ( )
12. Humpback whales produce low-pitched sounds in the mating season. ( )
13. Low-pitched sounds are transferred better in warm water than in cold water. ( )
14. Speaking language is a code detected by the eyes. ( )
15. Thumbs-down code means that you are angry. ( )
16. People use a rescue flare to communicate for long distances. ( )
17. Codes are useful for bees and ants because they can't talk like humans. ( )

18. Scout ants send smelly messages to nurse ants in case of the lack of food. (   )
19. Bats can't change echo into vibrations. (   )
20. Honeybees make a series of movements and vibrations to attract a mate. (   )

3 Write the scientific term:

1. A kind of beetles that light up their wings. (..............................)
2. They can communicate by different languages. (..............................)
3. The season in which humpback whales sing high-pitched sounds. (..............................)
4. The season in which humpback whales sing low-pitched sounds. (..............................)
5. The system that is responsible for processing all codes. (..............................)
6. A property that is used by bats to locate their prey in the dark water. (..............................)
7. A living organism that uses echo to locate its prey in the air. (..............................)
8. The sense that is used by blind people to detect echo. (..............................)
9. The sense that is used by bats to detect echo and locate the prey. (..............................)
10. A special device that is used by blind people to locate things nearby. (..............................)
11. The sense that helps honeybees to translate scout bees' motion.
12. The sense that helps ants to communicate. (..............................)
13. Ants that are responsible for sending smelly messages in case of the lack of food. (..............................)
14. Ants that are responsible for searching for food resources. (..............................)

4 Complete the following sentences:

1. The wings of fireflies .... due to a .... reaction inside their bodies.
2. Humans only can communicate using .... and ....
3. .... and .... use echo to communicate and hunt the prey.
4. Humans and animals can communicate by .... and ....
5. Men have .... pitched sound, while women have .... pitched sound.
6. Humpback whales change their .... according to ....
7. .... pitched sound is transferred better in cold water than .... pitched sound.
8. Winter is considered the .... season for humpback whales.
9. Hikers use .... to attract rescue helicopters.
10. Flashlight code can be detected by the .... sense, while drum code can be detected by .... organs.
11. If the food was near the scout bee, it does .... dance, while if the food was very far, it does .... dances.
12. .... can change echo to vibrations.
13. Bats produce .... pitched sound, then they use their strong .... sense to detect the ....
14. .... ants send smelly messages to .... ants if the food isn't enough.
15. Other bees in hives interpret the dance of the .... bee using their.................... sense.

5 Cross out the odd word:

1. Humans – Reading – Writing – Animals - Speaking (....................)
2. Dolphins – Humans – Bats – Echo (....................)

3. High-pitched sound – Women – Low-pitched sound – Sharp sound (..........................)
4. Winter – Feeding season – Mating season (..........................)
5. Fireflies – Humpback – Human – Sound energy (..........................)
6. Morse code – Human - Light patterns – Sound beeps – Dolphins (..........................)
7. Morse code – Long beeps – Dots – Dashes (..........................)
8. Bats – Canes – Honeybees – Dolphins (..........................)

6 Choose from column (A) what suits it in both columns (B) and (C):

Column (A) Living organisms	Column (B) Way of communication	Column (C) Depending on
1. Humans	a. use echolocation.	a. light energy only.
2. Fireflies	b. use Morse code.	b. sound energy only.
3. Bats	c. flash their wings.	c. sound and light energies.

1. .... 2. .... 3. ....

7 Choose from column (A) what suits it in column (B):

Column (A)	Column (B)
1. Scout bees	a. sing a wide range of tones to communicate.
2. Scout ants	b. light up their wings to warn off predators nearby.
3. Nurse ants	c. do a waggle dance if the food is far away.
4. Solider ants	d. search for food resources outside their colony.
5. Fireflies	e. protect the colony from any danger.
6. Humpbacks	f. send smelly messages to scout ants due to the lack of food.

1. .... 2. .... 3. ....
4. .... 5. .... 6. ....

8 Give reasons for:

1. Fireflies light up their wings.
2. Sound and movement codes are very important for animals.
3. Humpback whales produce high-pitched sounds in winter.
4. Humpback whales produce low-pitched sounds in summer.
5. Scout bees move in the form of eight pattern by vibrating their wings.
6. Sometimes nurse ants send smelly messages to scout ants.
7. Solider ants send smelly messages to other ants.
8. The cane turns echo into vibration.

9 What happens if:

1. Humpback whales produce low-pitched sounds in winter.
2. A scout bee comes very close to the flower.
3. A scout bee goes very far from the flower.
4. Food recourses decrease in a colony.
5. A colony is exposed to danger nearby.
6. An echo is picked up by a cane.

Guide Answers

Science Exercises for November Syllabus



Concept 4: Light and Sight

1

1 b	2 c	3 d	4 c
5 c	6 a	7 b	8 d
9 c	10 d	11 b	12 d
13 c	14 c	15 d	16 d
17 c	18 d	19 b	20 b

2

1 ✗	2 ✗	3 ✓	4 ✓
5 ✗	6 ✗	7 ✓	8 ✗
9 ✗	10 ✗	11 ✗	12 ✓
13 ✗	14 ✗	15 ✓	16 ✓
17 ✗	18 ✗		

3

1. Nocturnal animals
2. Fishing cats
3. Light energy
4. Light source
5. The sun
6. The moon
7. Night vision goggles
8. Behavioral adaptation
9. Structural adaptation
10. Eye pupil
11. Tapetum lucidum
12. Light
13. Light reflection
14. Transparent materials
15. Opaque materials
16. Opaque materials
17. Smooth shiny materials
18. Shadow

4

1. Bats - snakes - owls - cats
2. straight lines
3. structural
4. opaque
5. light
6. direction - angles
7. night vision goggles
8. back - nocturnal animals - structural
9. hearing - touch
10. little
11. wood - clothes - painted walls
12. mammals - 10
13. insects – lizards - birds
14. eyes - heads
15. air - water - glass
16. Rough

5

1. Fishing cats
2. Snakes
3. Humans
4. Moon
5. Plastic
6. Glass
7. Milk
8. Wood

6

1

Excellent Night Vision	Poor Night Vision
Owls - Fishing cats	Bats - Snakes

2

Transparent Mediums	Opaque Mediums
Plastic - Glass - Pure Water - Lenses	Wood – Metal – Book – Skin - Milk

3

Shiny Surfaces	Rough Surfaces	Transparent Surfaces
Mirror – Glass – Metal – Plastic	Wood	Glass

7

1. 1 ⇨ d 2 ⇨ b 3 ⇨ e
   4 ⇨ a 5 ⇨ c
2. 1 ⇨ d 2 ⇨ e 3 ⇨ a
   4 ⇨ b 5 ⇨ c
3. 1 ⇨ f 2 ⇨ c 3 ⇨ e
   4 ⇨ d 5 ⇨ a 6 ⇨ b

8

1. Figure (3)
2. a. smooth - mirror
   b. rough - wood
3. Transparent- Reflecting- Opaque
4. a. 3 b. 5 c. 2 - 4
   d. 1

9

1. Due to the presence of tapetum lucidum which reflects light rays that fall on it.
2. Because it does not give its own light, but it reflects the sunlight falling on it.
3. Because it gives its own light.
4. To allow more light to enter the eye and to see at night.
5. Because it reflect lights rays that fall on it.
6. Because they allows light to pass through them.
7. Because glass allow light to pass through it.
8. Because wood does not allow light to pass through it.

10

1. Light will be reflected from the objects to our eyes, so we can see them.
2. Light rays will be reflected regularly in one direction.
3. The human body will form a shadow.
4. It will pass through the glass.

Concept 4: Communication and Information Transfer

1
1. b 2. d 3. b 4. d
5. a 6. b 7. c 8. c
9. c 10. d 11. d 12. c
13. a 14. a 15. b 16. d
17. d 18. b 19. b 20. b
21. c 22. d 23. b 24. d
25. a 26. d 27. c 28. b
29. c 30. d

2
1. ✗ 2. ✓ 3. ✗ 4. ✗
5. ✓ 6. ✗ 7. ✓ 8. ✓
9. ✗ 10. ✗ 11. ✓ 12. ✗
13. ✓ 14. ✗ 15. ✗ 16. ✓
17. ✓ 18. ✗ 19. ✓ 20. ✗

3
1. Fireflies 2. Humans
3. Winter 4. Summer
5. The nervous system
6. Echolocation 7. Bat
8. Touch 9. Hearing
10. A cane 11. Sight
12. Smell 13. Nurse ants
14. Scout ants

4
1. flash - chemical
2. speaking - writing
3. Bats - dolphins
4. light - sound 5. low - high
6. sound pitch - seasons
7. high - low 8. mating
9. mirrors
10. sight - hearing
11. one - three 12. A cane
13. high - hearing- echo
14. Nurse - scout
15. scout – sight

5
1. Animals 2. Humans
3. Low-pitched sound
4. Feeding season
5. Fireflies 6. Dolphins
7. Dots 8. Honeybees

6 1 ⇨ b, c 2 ⇨ c, a 3 ⇨ a, b

7 1 ⇨ c 2 ⇨ d 3 ⇨ f
4 ⇨ e 5 ⇨ b 6 ⇨ a

8
1. To warn from predators or to attract a mate.
2. Because they cannot talk or write like humans.
3. Because high-pitched sounds travel better through cold water.
4. Because low-pitched sounds travel better through warm water.
5. To tell the bees about the direction of the food.
6. Due to the lack of food and water resources.
7. Due to a danger nearby.
8. To pick echo with their thump and make blind people sense the surroundings.

9
1. Sounds of humpback whales will not travel through cold water.
2. It will make one dance.
3. It will make three round dances.
4. Nurse ants send smelly messages to scout ants.
5. Soldier ants send smelly messages to the other ants.
6. It will vibrate and the blind person can sense it by his/her thumb.

November Tests

Test (1)

1 A) Complete the following with an answer from brackets:

1. Light doesn't pass through .... objects.
(opaque – transparent)
2. Light reflects in one direction when it falls on ....
(a mirror – a painted wall)
3. High-pitched sounds are transmitted well in ....
(cold water – warm water)
4. Nurse ants send smelly messages to scout ants when there is ....
(food shortage – danger)

B) When a group of people sing together, we can distinguish them.
Mention the property with which we distinguish these sounds.

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. We see things because our eyes emit light. ( )
2. Humans have tapetum lucidum in their eyes to help them see at night. ( )
3. Humans can influence the patterns of fireflies beetles' flash lights. ( )
4. Bees emit scents to tell the other bees about the location of flowers. ( )

B) I saw an eye glowing in the dark. This animal may be ....

3 A) Choose the correct answer:

1. The .... is a source of light.
   a eye b moon c fire d mirror
2. The tarsier and the .... are similar in their large eyes.
   a owl b fishing cat c polar bear d fennec fox
3. Putting the thumb up or down is a kind of ....
   a colors b codes c lights d waves
4. To contact by sight, we need to ....
   a make a sound b have light
   c hear music d touch things

B) Fecial expressions are a coded signal. Give reason.

Test (2)

1 A) Complete the following with an answer from brackets:

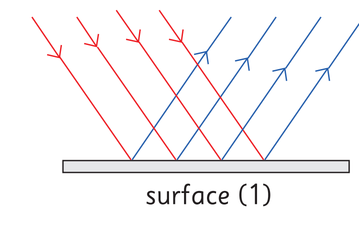
1. Lenses are considered .... objects. (opaque – transparent)
2. A mirror is a shiny surface because it ....
   (radiates light – reflects light)
3. Humpback whales' sounds get louder in ....
   (cold water – warm water)
4. .... is one of the methods in which humans communicate.
   (Echolocation – Writing)

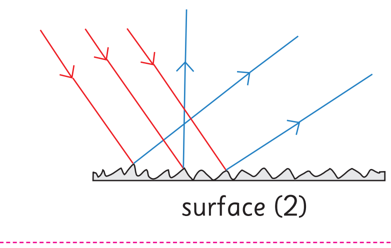
B) Fireflies beetles are animals that are able to produce light due to a reaction taking place inside their bodies.
Mention the type of reaction. ....

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. Nocturnal animals have larger eyes than humans. ( )
2. The ear is the sense organ responsible for seeing things. ( )
3. The red and green traffic lights are a type of codes. ( )
4. The scout bee rotates around itself in the form of number 6 to tell the other bees about the place of food. ( )

B) Which of the following surfaces represents the reflection of light rays off a wooden spoon?


surface (1)


surface (2)

3 A) Choose the correct answer:

1. The ....'s eyes glow, so it can see in the dark.
   (a) fishing cat (b) bat (c) penguin (d) human
2. Which of the following isn't a source of light?
   (a) The moon (b) The sun
   (c) The fire (d) The electric bulb

3. Humpback whales use songs to ....
   a hide from enemies   b play with whales
   c keep warm   d reproduce and feed
4. You can determine the train sound level by ....
   a sound pitch   b sound tone
   c echo   d sound type and tone

B) What happens when light falls on a transparent object?

Test (3)

1 A) Complete the following with an answer from brackets:

1. .... is an opaque object. (Glass – Carton)
2. When light hits an object, a .... of this object is formed. (tapetum lucidum – shadow)
3. The .... is one of the organs that can be used to send or receive code. (eye – heart)
4. Humpback whales communicate by using the sense of .... (hearing – sight)

B) What happens if a flower is close to scout bees?

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. The fishing cat can't hunt at night because of the dark. (   )
2. Using our eyes to see is a way that helps us collect information about our surroundings. (   )
3. Fireflies beetles use light to protect themselves from enemies. (   )
4. Ants produce flashes of light to guide the other ants towards the place of food. (   )

B) Which of the following surfaces represents the reflection of light rays off a mirror surface?

surface (1)   surface (2)

3 A) Write the scientific term that each phrase indicates:

1. The thing that emits its own light. (..............................)
2. A thin layer at the back of some animals' eyes that reflects light. (..............................)
3. A pattern that has a meaning. (..............................)
4. Something that encodes information in the form of a flash of light to tell sailors about their position. (..............................)

B) The sound of Humpback whales get louder in winter. Give reason.

Test (4)

1 A) Complete the following with an answer from brackets:

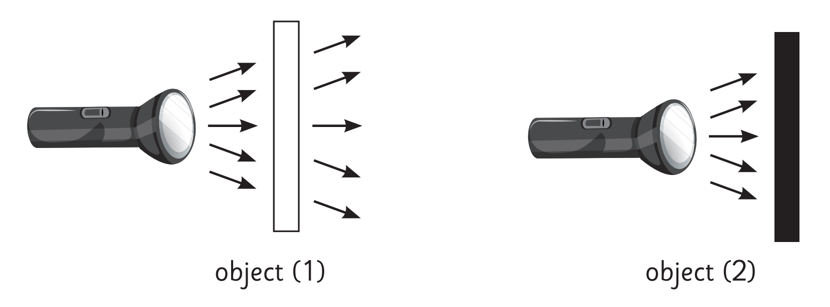
1. The light reflects better when it falls on a .... (mirror – piece of rock)
2. The eyes of the tarsier .... any light around. (collect – scatter)
3. The high-pitched sound is .... (sharp – thick)
4. Transferring information in the form of sounds represents a/an .... (echo – code)

B) Writing is one of the simple codes. Give reason.

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. If I see my face clearly on a surface, it means that the surface is smooth and shiny. ( )
2. Cats can see in the dark by echolocation. ( )
3. Morse code is a means of communication among people through sound and light. ( )
4. When there's a food shortage, the ants produce some movements to alert the scout ants. ( )

B) Look at the path of the light rays in the two pictures (1) and (2), then identify the opaque object.



3 A) Write the scientific term that each phrase indicates:

1. A structural adaptation inside the eye that provides some animals with better night vision. (....................................)
2. The visual image of energy that transfers in the form of waves. (....................................)
3. Animals that use flash lights patterns to send messages. (....................................)
4. Animals that use singing tones to send messages. (....................................)

B) Your friend wants to stop light coming into his room. Suggest some materials that he can use on the window to stop the light coming into the room.

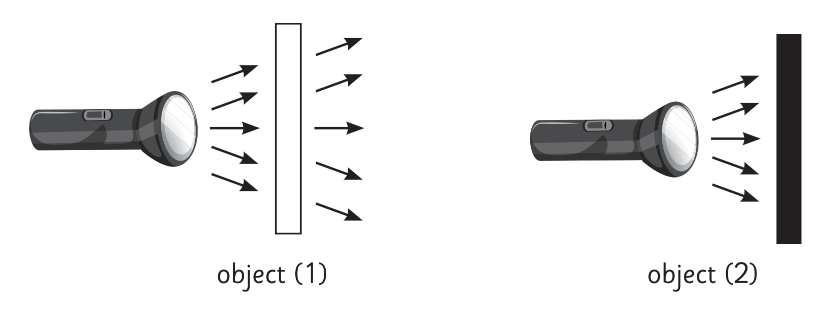
Test (5)

1 A) Complete the following with an answer from brackets:

1. The tarsier is a .... animal. (large – small)
2. Fireflies beetles produce light to attract .... (predators – the other gender)
3. Using sign language by the disabled is a type of .... (codes – waves)
4. The traffic lights depend on the sight sense in communication, such as .... (fireflies beetles – whales)



B) Look at the path of the light rays in the two pictures (1) and (2), then identify the transparent object.



2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. We see objects in light because they reflect the light rays to the eyes. (   )
2. The eye is the organ responsible for realizing what we see. (   )
3. Facial expressions in different ways are a type of codes. (   )
4. Bees can distinguish between sweet and bitter tastes by using the sense of smell. (   )

B) A shadow is formed when light falls on an opaque object. Give reason.

3 A) Choose from column (A) what suits column (B):

(A)	(B)
1. Vibratory movements	( ) a) A feeling that helps us hear birds.
2. The ear	( ) b) The visual image of energy traveling in the form of waves.
3. Tapetum Lucidum	( ) c) A method by which some animals communicate.
4. Light	( ) d) A structural adaptation of some animals for better night vision.
	( ) e) is an organ that we can use to send or receive codes.

B) Mention a common means of communication between humans and some animals.

Answers

Test (1)

1 A) Complete the following with an answer from brackets:

1. opaque 2. a mirror 3. cold water 4. food shortage

B) sound pitch

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. ✗ 2. ✗ 3. ✓ 4. ✗

B) a fishing cat

3 A) Choose the correct answer:

1. c fire 2. a owl 3. b codes 4. b have light

B) Because they help people know what we are thinking about and if we are happy or angry.

Test (2)

1 A) Complete the following with an answer from brackets:

1. transparent 2. reflects light 3. cold water 4. Writing

B) Chemical reaction

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. ✓ 2. ✗ 3. ✓ 4. ✗

B) Surface (2)

3 A) Choose the correct answer:

1. a fishing cat 2. a The moon
3. d reproduce and feed 4. a sound pitch

B) The light passes through it.

Test (3)

1 A) Complete the following with an answer from brackets:

1. Carton 2. shadow 3. eye 4. hearing

B) They do one round dance.

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. ✗ 2. ✓ 3. ✓ 4. ✗

B) Surface (1)

3 A) Write the scientific term that each phrase indicates:

1. Light source 2. Tapetum lucidum
3. Code 4. Lighthouses

B) Because high-pitched sounds travel well in cold water.



Test (4)

1 A) Complete the following with an answer from brackets:

1. mirror 2. collect 3. sharp 4. code

B) Because the arrangement of letters has a meaning and transfers information.

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. ✓ 2. ✗ 3. ✓ 4. ✗

B) Object (2)

3 A) Write the scientific term that each phrase indicates:

1. Tapetum lucidum
2. Light
3. Fireflies beetles
4. Humpback whales

B) Opaque objects, such as wood or carton.

Test (5)

1 A) Complete the following with an answer from brackets:

1. small
2. the other gender
3. codes
4. fireflies beetles

B) Object (1)

2 A) Put a (✓) for the correct statement and a (✗) for the incorrect statement:

1. ✓ 2. ✗ 3. ✓ 4. ✗

B) Because the light falling on it either bounces off or is absorbed.

3 A) Choose from column (A) what suits column (B):

1. c) 2. e) 3. d) 4. b)

B) Light / Sound.

Q) What are the structures that the animals have, but the humans don't?

Animals have special eyesight, called "Tapetum lucidum", which means "Light tissue".

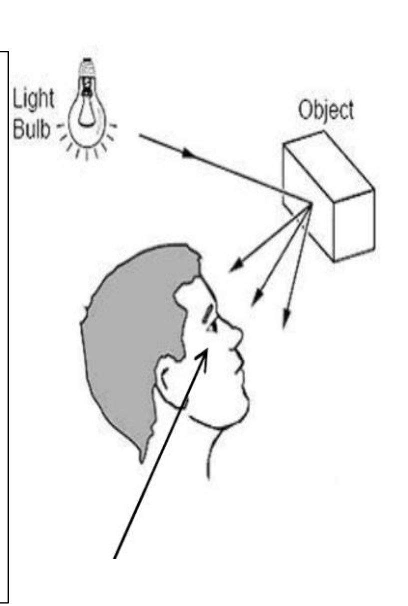
"Tapetum lucidum" is a way by which animals adapt to hunt at night.

"Tapetum lucidum" is a reflective layer behind the retina, that reflects the light one more time towards the retina.



Light reflection: is the bouncing (returning) of light rays when light falls on a reflecting surface.
When light falls on objects,

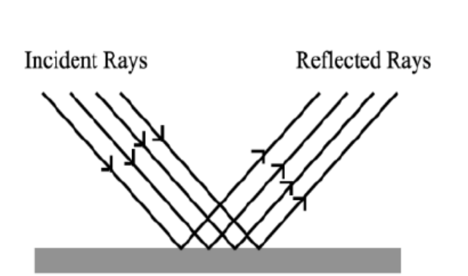
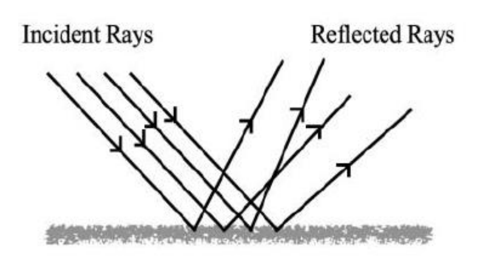
light reflection occurs and reaches our eyes then The light enters through the transparent layers of the eye and the lens focuses the light in the area inside the eye and converts the images into messages to the brain through the nervous system, so we see the body.



The light reflection occurs in the presence of:

1- Source of light **2- reflecting surface**

Types of light reflection

Regular reflection.	Irregular reflection
-It is the reflection of light when it falls on a **smooth** and **shiny reflecting surface**, where light rays are **reflected** directly in **one direction.** Examples of things that regularly reflect light: 1- Mirrors 2- Glass 3- Metals  	It is the reflection of light when it falls on a rough surface , where light rays are **reflected and scattered in different directions.** Examples of things that irregularly reflect light: 1- Paper 2- Wood 3- Fabric 4- plastic 

Materials can be classified according to the amount of light that transmits through them into:

Transparent materials	**Opaque materials**
The materials which allow **most** light to pass through and objects can be **seen through Transparent materials**	The materials which **do not** allow light to pass through and objects **cannot be seen through opaque materials**
1-Clear glass. 2-Air. 3-Clear water. 4-Transparent plastic.	1-Rocks. 2-Carton. 3-Wood. 4-Aluminium foil. 5-Our bodies. 6- Books.

1-4 Communication and information transfer

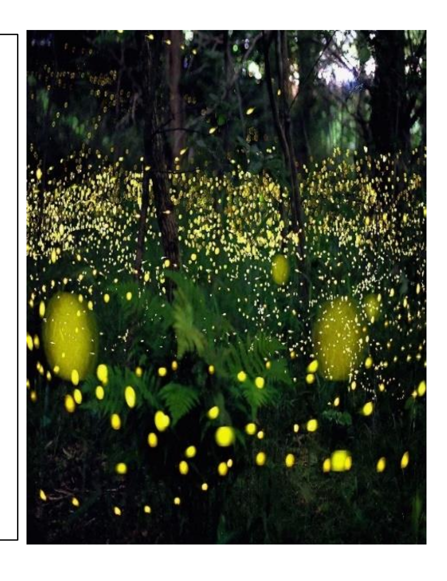
Animals and humans send and receive information by different communication systems, so they use light to help them see and use their senses to communicate.

Fireflies or lightning bugs or Glow beetles

-A chemical reaction takes place inside the beetles' bodies, causing them to light up.

-Glow beetles do not belong to flying insects, but use their wings to release flashes to warn about presence of predators or to attract the opposite sex to make babies, flashing at regular periods

-Flashing patterns are messages



Lesson (2) Song of Whales

- **Dolphins and whales:** use **sound energy** to communicate with each other.
- **Fireflies:** use **light energy** to communicate with each other.
- **Humans:** use **language** to communicate with each other.
- **Ear:** A sense organ that can detect **sound** energy.
- **Eye:** A sense organ that can detect **light** energy.

Humpback whales

Humpback whales: use **hearing sense**, they sing a wide range of **tones** and **songs** series.

Sound is described as:

1- **High pitched sound:** **soft** sounds such as **women voice**.

2- **Low pitched sound:** **rough** sounds such as **man voice**.

Humpback whales: use high- or low-pitched sounds according to the seasons:

In winter months	In summer months
The songs of humpback whales have **high-pitched sounds**	The songs of humpback whales have **low-pitched sounds**
High-pitched sounds travel better through **cold water**	Low-pitched sounds travel better through **warm water**
Songs of **mating** season.	

Transferring Information

Sense organs collect information then send it to the **brain** through **nerves** for **processing** (**decodes**).

1- Human waving.
2- Man stops by seeing a red traffic light.
3- Using a rescue flare.
4- Using signal fires.
5- **Hikers** (travelers) use **mirrors** to attract rescue helicopters.
6- **Sailors** use light houses to tell where they are.





Note: Light travel very **fast** over distances.

Codes and Transferring Information

Code: Information that transformed into another **representative** form.

- **Human:** use **codes** to transmit information.

Forms of codes:

1- **Thumbs-up code:** A code that means that you say "Yes".



2- **Thumbs-down code:** A code that means that you say “No”.

3- **Faces expressions** - **Red or green traffic light**

4- **Language and music codes: sounds** form (tunes) use sense of **hearing** to communicate.

5- Different languages have **different** codes.

6-Writing code: symbols form use sense of **sight** to communicate.

Lesson (3) Inventing a code

? **Fireflies:** use **flashing** light patterns to communicate.

? **Humans:** designed **Morse Code** system using **sound** or **light**.

Morse Code

Morse Code: A communication system developed by **Samuel Morse** in the 19th century.

Morse Code: A communication system that depend on **sound** or **light** energy.

Morse Code: A **simple** code consists of **short beeps** known as **dots** and **long beeps** known as **dashes**.

Dots: The short beeps of sound (**short flashes of light)** in Morse code.

Dashes: The long beeps of sound (**long flashes of light)** in Morse code.

Dots and dashes: represent different **letters of alphabet**.

Lesson (4) Animals Communicate with Movement

-**Humans and animals** use different ways to communicate as **sound – light – movement**.

Honey Bees use **movement** to communicate

Bees live in the **hive Ants** live in **colonies**

Bees use a **figure-eight pattern** dance and vibrate its **wings** as a **code (G.R)** to find **food** and **water**.

The scout honeybee is responsible for **searching** out **food** sources.

The scout honeybee makes **one round dance** for **near** flower.

The scout honeybee makes **one waggle dance** for **far** flower.



Honey bee makes a series of **movements** and **vibrations** with **wings** for **flower location**.

Honey bee use **codes with movements** to communicate through **sight** sense.

Humans use **movements** to communicate **such as**:

Sign Language: It used by people of **special needs**. **Simple gestures.**

Communication Systems

System: It is a group of **related objects** that work together to perform a function.
Communication systems designed by **human** used to make communication easily.
Communication systems used to **send** and **receive** information.
Examples of communication systems: are
-electronic devices
- technology systems such as: cell phone – computer – TV
Communication systems depend on :
-**signals** in their work.
-**Electronic devices** are connected with **satellites**, **communication towers** and **software** to **transfer information** in correct way.
Animals don't use technology systems but use other systems.



Ants live in **colonies**.
Groups of **ants** in a colony have **different** roles.
Nurse ants send **smelly** message when the amount of food decreases.
Scout ants search and **locate food**.
Solider ants are warning and protect colony from **dangers**.
Ants use **smell** sense. **Bees and fireflies** use **sight** sense.

Lesson (5) Technology Inspired (get benefit) by Nature

- **Bats** use **sound** to communicate by **hearing** sense.

Bats use **ears** for **echolocation** to make **high-pitched sound** reflected from object by **echo**.
Scientists inspired by bat **echolocation** to help **blind people**.
Scientists created a **cane** with **high-pitched sound**, the reflected **echo** make **vibrations** with person **thumb** to locate objects as **bats**.

- Special cane of blind person **similar** to bats in **a high-pitched sound**.
- Special cane of blind person **different** from bats in **has vibrations**.(**bat can't make it**)
- Special cane of blind person **similar** honeybees in makes vibrations.
- **Bats** live in **caves** (**dark places**)
- **Bats** make **high-pitched sound,** So humans can't hear it.
- **Bats** feed on insects and mosquitoes.
- **Bats** make sounds about **food** or where to get **sleep**.

General questions Grade 4 November revision

Q.1: Complete the following statements from the brackets:

1- Tapetum lucidum is a thin layer in the eyes of some animals that ………..
(scatters light - reflects light)

2- Objects that do not allow light to pass through them are…..…..
(transparent objects - opaque objects)

3- Lenses are considered ……. (transparent objects - opaque objects)

4- Light is reflected in one direction, when it falls on a ….. (mirror - painted wall)

5- When the light falls on an opaque, surface, it is. (spread – reflected)

6- When light falls on smooth, shiny surface it ….
(Bounces in one direction - scatters in different directions)

7- A shadow that is formed behind the body is…….. (opaque - transparent)

8- No shadow is formed behind the body that is……. (opaque - transparent)

Q2 Put (✓) in front of the correct statement, and (✗) in front of the incorrect statement:

1 - We cannot see without light. ( )
2- Some animals can see in the dark, such as cats and horses. ( )
3 - Nocturnal animals have a transparent membrane to collect light inside eye.( )
4 - Cardboard is considered an opaque material. ( )
5- Human skin is a transparent material that allows light to pass through it. ( )
6- Rough objects reflect light better than smooth objects. ( )
7- When light falls on rough surfaces, it is scattered in different directions. ( )
8 - When light falls on a broken mobile screen, it is reflected in one direction. ( )
9- Light travels in curved lines ( )

Q.3Choose the correct answer from the following:

1- Which of the following groups of materials have the best light reflection?
A- Foil, a rocky road, a mirror.
B- A wooden spoon, a tree branch, aluminum foil.
C- A metal spoon, a mirror, a stainless steel plate.
D- A mirror, a plastic spoon, a piece of stone.

2- When light falls on a mirror and on a wall, the light falling on the mirror:

A- is better reflected

B- is scattered

C- is poorly reflected

D- isn’t reflected

3- Seeing yourself in the mirror depends on …….property of light .

A- refraction

B- reflection

C- absorption

D- relativity

4- The arrows in each figure represent the rays of light. Which figure shows how light is reflected on a mirror?

A B C D

5- Shiny surfaces ……..light rays.

A-refract

B- reflect

C- scatter

D- absorb

Q.4Classify the following materials into transparent and opaque materials:

1- A chair made of wood. ………………….

2 - An aluminum pot……………………………

3 – Air……………………………………………

4- Football……………………………………..

5- Glasses of glass……………………………..

6 – Concrete…………………………………..

Q.5The figure shows the reflection of light when it falls on an object.

1- The body in the figure is………

(shiny smooth – rough)

2- This body may be a …….. (mirror - painted wall)

Q.6 In the opposite figure, the shadow of the tree is formed on the ground, answer the following questions:

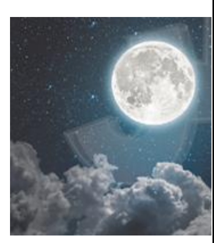
1 - The body of the tree……. sunlight to pass through it(allows-doesn't allow)



2 - The tree is ……………..(from light sources - not from light sources)

3- The tree is a/an…………. body. (transparent – opaque)

Q.7 Two friends are discussing the reason for seeing the moon in the sky at night:



- **The first friend said: "We see the moon because it reflects sunlight"**
- **The second friend said: "We see the moon because it is from sources of light"**

Which interpretation is correct?



Q.8 Answer the following questions:

1-Your friend wanted to prevent the light from entering his room.

Suggest some materials he could use on the window, to prevent the light from entering the room.

2- Complete from the opposite figure:

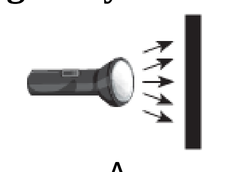
- Light falls on the …… then is reflected on the eye

- Eyes ……… the message to ……, that interpreters and translates it, so we see the apple.

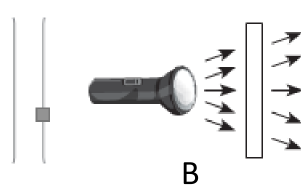
3 - In the opposite fig. Look at the path of the light rays:

- Which of the two objects is opaque….

- Which one is transparent…….



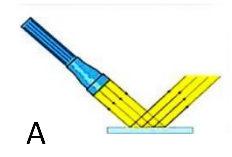
A



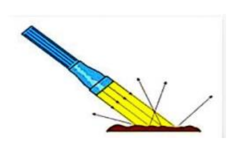
B

4 - I saw an eye shining in the dark. In your opinion, what is this animal?

5- Which of the following two figures, represents the reflection of light rays from a wood



A



B

Model exam (1)

1]A) Complete the following from the brackets:

1-Light does not pass through ……….matter. (transparent - opaque)

2-Light is reflected in one direction when it falls on……. (mirror - painted wall)

3-High-pitched sounds travel well in………….. (cold water - warm water)

4-Worker ants emit a strong scent as alert messages to scout ants at .... (lack of food - danger)

B]When a group of people sing together,we can distinguish between them.

Mention sound property that helps us to distinguish between them

....

2] A)Put (✓) in front of the correct statement, and (✗) in front of the wrong one:

1-We see objectss because the eye emits light. ( )

2-Man has the transparent layer over his eye to help him see at night. ( )

3-Humans can influence the patterns of beetle flashes. ( )

4-The bees release scents to tell the rest of the bees about the location of the flowers. ( )

B) I saw eyes shining in the dark.

This animal may be ……………………………………….

3]A) Choose the correct answer from the given answers:

1. .... from Light sources

a-Mirror b- fire c-the moon d- Eye

2-The eyes of the tarsier monkey are similar to those of the large eyes of ……..

a-Fennec fox b-Polar bear c-fishing ca d-owls

3-Raising the thumb up or lowering it down is a type of ....

a-waves b-The lights c-cipher d-colors

4-To communicate through the sense of sight we need ……….

a-touching thing b-Hear the music c-provide light d- make a sound

Model exam (2)

1]A)Complete the following from the brackets:

1-Lenses are considered………………. (transparent objects - opaque objects).

2-Mirror is a shiny surface because it…………… (emits light - reflects light).

3-Humpback whales are louder sound in………. (cold water - warm water)

4-…….one of the methods of human communication (echolocation - writing)

B) Glowing beetles are animals that can emit light due to a reaction inside their bodies. mention This reaction type ……………………….

2]Put (✓) in front of the correct statement, and (✗) in front of the wrong one:

1-Nocturnal animals have eyes larger than human eyes. ( )

2-The ear is the sensory organ responsible for seeing things. ( )

3-Red and green traffic lights are codes. ( )

4-The scout bee rotates around itself in the form of 6 to tell the rest of the bees where the food is. ( )

B)Which of the following surfaces represents the reflection of light rays from wooden spoon? ....

A

B

3]A)Choose the correct answer from among the given answers:

1-………… eye glows and it can sees in the dark.

a-Human b-Penguin c-Fishing Cat d-Bat

2-Which of the following is not considered a source of light?

a-Light Bulb b-fire c-The sun d-Moon

3-Humpback whales use singing for ....

a-Reproduction and feeding b-escape from enemies c-having fun with whales d-heating

3- You can determine how loud the train is by ....

a-Pitch Sound &pattern b-Echo c-Sound pattern d-Sound pitch

B)What happens when light falls on a transparent object? ……………………

Model exam (3)

1]A)Complete the following from the brackets:

1-…………………….. is an opaque body (Cartoon - Glass)

2- When opaque object obstruct Light ……Is formed (Transparent - shadow)

3-………from the organ which Could be used to send or receive codes (Eye - heart)

4- Hunchback whales communicate by ………………… Sense (Hearing - Sight)

B) what happen in case of flower is close to the bees scout ?

………………………………………………………… .

2]A)Put (✓) in front of the correct statement , and (✗) in front of the wrong statement:

1-The fishing Cat cant hunt in the dark . ( )

2- Our eyes help us to collect information about environment Surrounding ( )

3-firflies beetles use light to protect it from enemies. ( )

4- Ants gives Flashes Light to guide other Ants about Place of Food . ( )

B) Which Surface represents reflection of light rays from mirror ؟

…………………………………………

A

B

3]A)Put the scientific term

1-the object that emits light. (………………………………………)

2-thin layer in the eye of some animals that reflect light . (………………………………………)

3- Pattern that has a specific meaning that guide the sailors

4- send a code in the form of flashes of light that tell sailors where they are. (…………………)

B)Give reason :

Hunchback Whales has loud sound in winter Season

…………………………………………………………………………

Model exam (4)

1]A)Complete the following:

1-Light is reflected better when it falls on……………………. (mirror - piece of stone)
2-The eyes of the tarsier monkey ………..light around. (collect – separate)
3-The………sound is high pitched sound (sharp - rough)
4-Transferring information in the form of sounds represents a\an….…. (echo - code)

B)Give reason

Writing is considered a simple code.

……………………………………………………………………………….

2]A)Put (✓) in front of the correct statement, and (✗) in front of the wrong statement:

1-I can see my face clearly on a surface, it means that it is a smooth surface. ( )

2-Cats can see in the dark by echolocation. ( )

3- Morse code is a way of communicating between people by sound and light. ( )

4- When food is lacking, the ants make some movements to alert the searchlight ants. ( )

B) Look at the path of the light rays in images (1) and (2) ,then select the opaque object. Body (1) OR Body (2).

1 2

3]A)Write the scientific term :

1-A sstructural adaptation in the eye provides some animals with better vision during the night (…………………………..)
2-Is a form of energy transmitted in waves. (....)
3-Animals use flashes of light patterns to send messages. (....)
4-A simple code depends on a short beeps called dot and long beeps called dashes (....)

B) Your friend wanted to prevent light from entering his room.
Suggest some materials that he can use on the window to prevent light from entering the room.

. ...

Model exam (5)

1]A)Complete the following parentheses:

1-Tarsair monkey is a ……………animal (large size - small size)

2-firflies beetles emit light to attract …………………. (predators - other sex)

3-People of determination(disabled) use sign language is a type of (codes - waves)

4-Traffic lights depend on the sense of sight to communicate such as ...

(fireflies beetles - dolphins)

2]A)Put (✓) in front of the correct statement, and a (✗) in front of the wrong statement:

1-We see objects in the light because the objects reflect the rays of light back to the eye. ( )

2-The organ responsible for perceiving what we see is the eye. ( )

3-Face expressions in different ways are considered codes . ( )

4- Bees can distinguish the sweet and bitter taste by their sense of smell. ( )

B)Give reason

A shadow is formed when light falls on an opaque object. .

3]A)Choose from column (B) what suits column (A): (b)

A	B
1-Vibrating movements	( ) sensory organ that helps us hear birds.
2 Ears	( ) The visual image of energy transmitted in waves.
3-Tapetum lucidum	( ) A way of communication between some animals
4-Light	() Structural adaptation of some animals to better vision at night.
	( ) Of the organs that we can use the receiver code.

B)Mention one common way of communication between humans and some animals.

.. .

Answers :

Model 1 :

1]A) Complete the following from the brackets:

1- opaque

2- mirror

3- cold water

4-lack of food

B] Sound pitch

2] A)

1- (✗)

2- (✗)

3- (✓)

4- (✗)

B) I saw eyes shining in the dark.

Fishing cat

3]A) Choose the correct answer from the given answers:

1. fire

2-owls

3-codes

4-provide light

Model exam (2)

1]A)Complete the following from the brackets:

1- transparent objects

2- reflects light.

3- cold water

4-writing

B) Chemical reactions

2]

1- (✓)

2- (✗)

3- (✓)

4- (✗)

B)Which of the following surfaces represents the reflection of light rays from wooden spoon?

Fig. B

A

B

Choose the correct answer from among the given answers:

1- Fishing Cat

2- Moon

3- Reproduction and feeding

3-Sound pitch

What happens when light falls on a transparent object?

Light passes through the transparent object

Model exam (3)

1]A)Complete the following from the brackets:

1-Cartoon

2- shadow

3 -Eye

4- Hearing

B) it dances one dance .

2]A)Put (✓) in front of the correct statement , and (✗) in front of the wrong statement:

1-The fishing Cat cant hunt in the dark . (✗)

2- Our eyes help us to collect information about environment Surrounding (✓)

3-firflies beetles use light to protect it from enemies. (✓)

4- Ants gives Flashes Light to guide other Ants about Place of Food . (✗)

B) Which Surface represents reflection of light rays from mirror ؟

Fig. A

A B

3]A)Put the scientific term

1- (Light source)

2- (Tapetum lucidum)

3- code

4- Lighthouses

B)Give reason :

- because high pitched sound travel faster in cold water

Model exam (4)

Complete the following parentheses:

1- mirror
2-gather
3-sharp
4-a code

B) Give reason

Because it uses symbols in a pattern to give a specific meaning according to the arrangement of letters.

2]A)Put (✓) in front of the correct statement, and (✗) in front of the wrong statement:

1-I can see my face clearly on a surface, it means that it is a smooth surface. (✓)

2-Cats can see in the dark by echolocation. (✗)

3- Morse code is a way of communication between people by sound and light. (✓)

4- When food is lacking, the ants make some movements to alert the searchlight ants. (✗)

B) Body (1)

1 2

3]A) Write the scientific term:

1- (tapetum lucidum)
2- (light)
3- (fireflies beetle)
4-. (Mores code)

B) Your friend wanted to prevent light from entering his room. Suggest some materials that he can use on the window to prevent light from entering the room.

.**He must use opaque object like cartoon – wooden window**

Model exam (5)

Complete the following parentheses:

1- (small size)

2-(other sex)

3- codes

4-fireflies beetles

2]Put (✓) in front of the correct statement, and a (✗) in front of the wrong statement:

1-We see objects in the light because the objects reflect the rays of light back to the eye. (✓)

2-The organ responsible for perceiving what we see is the eye. (✗)

3-Face expressions in different ways are considered codes . (✓)

4- Bees can distinguish the sweet and bitter taste by their sense of smell. (✗)

Give reason

b- because it doesn't allow light to flow through it

3]Choose from column (B) what suits column (A): (b)

A	B
1-Vibrating movements	(2) sensory organ that helps us hear birds.
2 Ears	(4) The visual image of energy transmitted in waves.
3-Tapetum lucidum	(1) A way of communication between some animals
4-Light	(3) Structural adaptation of some animals to better vision at night.
	( ) Of the organs that we can use the receiver code.

B)
Light and sound

Write the scientific term of each of the following:

- A living organism that can fly and depend on the echolocation property to get information about its surroundings in the dark.

- A simple tool (device) used by blind people to walk safely.

- Honeybees which are responsible for searching out food resources.

- The sense by which bees receive movement codes that are sent by the scout honeybees.

- Small living organisms that live in colonies and communicate with each other by smelly messages to perform different roles.

- A group of ants which is responsible for sending smelly messages when there is a shortage of food.

- A communication system developed by Samuel Morse in the 19th century.

- The short beeps in Morse code.

- The long beeps in Morse code.

- A season in which the humpback whale produces high-pitched sound.

- A season in which the humpback whale produces low-pitched sound.

- Pitched sounds which travel through cold water better than through warm water .

- Pitched sounds which travel through warm water better than through cold water .

- Sense organ that can detect sound energy.

- Sense organ that can detect light energy.

- It is a pattern that has meaning.

- A kind of beetle that lights up its wings

- They can communicate by different languages

- Energy that is used to communicate among humpback whales.

- Energy that is used to communicate among fireflies.

- The way of communication among honeybees.

- The sense that helps honeybees to translate scout bee motion.

- The sense that helps ants to communicate .

- Ants that are responsible for sending smelly messages in the case of a lack of food.

- Ants that are responsible for searching for food resources

- The sense used by the blind person to detect echo.
- The sense used by bats to detect echo and locate their prey.
- They are things that give off their own light.

- .A life-saving structural adaptation that gives fishing cat excellent night vision.

- They are objects that allow light to pass through.

- It is a visible form of energy that travels straight line in the form of waves.

True or false

- The moon is considered one of the sources of light.
- Fishing cats have a mirror-like membrane in front of their eyes.
- Hunting at night for nocturnal animals is considered behavioral adaptation.
- Smooth materials reflect light more than rough materials.
- Light waves travel in the air in the form of curved line

- Tarsier eats insects, small lizards and small birds.
- Tarsiers, fishing cats, humans and owls have an excellent night vision.
- Panther chameleon eyes can move independently of each other, tarsier and owl eyes cannot move in their sockets.
- Both of tarsier and fishing cat can turn their heads 180 degrees.
- transparent material that allow light to pass through.
- opaque material that don't allow light to pass through.

- owl and tarsier are nocturnal animals that have excellent night vision
- Humans and animals use light to communicate.

- The wings of fireflies flash due to a physical reaction only inside their bodies.

- Both humpback whales and Morse code can use sound energy in communication.

- Firefly beetles and Morse code can use light energy in communication.

- Both humpback whales and Morse code can use sound energy in communication.

- Morse code may use long and short flashes of light instead of long and short beeps.

- Bees use flash light to communicate with each other.
- Animals use technological systems as we do.

- Bats make low-pitched sound and then listen for an echo.
- special cane change the echo into vibrations.
- Human can see in dim light
- Tapetum lucidum is a structural adaptation in the human eyes.
- Paper reflects more light than a mirror does.
- The scout honeybee makes two round dance if the flower is very close
- The scout honeybee performs a waggle dance in the direction right to left if the flower is far away
- dancing bee moves in a figure-five pattern while vibrating its wings.
- Groups of ants within a colony have similar roles.

complete

- ...can change echo to vibrations.

- The echo is turned into vibrations that a person can feel using his....

- Short beeps in Morse code are represented by....
- long beeps in Morse code are represented by....
- Men have a....pitched sound pitched sound, while women have a....

- Humpback whales change their. ....according to....

- ...pitched sound transfers in cold water better than.....pitched sound .
- Winter is considered the......season for humpback whales while summer is..... season

Choose

- All the following things are considered as light sources, **except**.

  a. the Sun. b. fire.

  c. eye. d. the light lamp.

- Which of the following organs are working together for seeing different objects..........?

  a. Nose and brain. b. Eyes and brain.

  c. Ears and brain. d. Tongue and brain.

- Both tarsier and owl

  a. can swim .b.. belong to the same species

  c. are nocturnal animals. d. can fly

- Humans have eyes… than nocturnal animals.

a. bigger c. stronger

b. smaller d. sharper

nocturnal animal have eyes… than Humans

a. bigger c. stronger

b. smaller d. sharper

- All the following materials are rough, **except**

a. cloth. b. mirror.

c. wood. d. paper.

- Which of the following objects is shiny and smooth?

a. Metallic spoon. D. Plastic spoon.

c. Wooden chair. B.T-shirt.

- …are ……considered sources of light.

b. Lamps and mirrors a. Sun and moon

c. Fires and moon d. Flashlights and candles.

- ....and... are nocturnal animals that have poor night vision.

  a. Owls and snakes b. Bats and cats
  d. Bats and snakes c. fishing cat, Owl

- animals ......seem to glow in the dark.

  a. owls c. bats
  d. snakes b.fishing cat

- The eye is the sensory organ that is affected by the

  a.heat b.Sight
  c.sound d.Taste

- In complete darkness, many nocturnal animals can detect environment using all the following senses, except..

  a.smell b.touch
  b.hearing c. sight

- inside the eye is responsible allow more light

a. Cornea b. Lens

d. Pupil

- The pupils of nocturnal animals open.. ...than pupils of human

a. narrower b. wider c. similar

- The pupils of human open.. ...than pupils of nocturnal animals

b. narrower b. wider c. similar

- All these animals have tapetum lucidum in the back of their eyes except

a. deers d. horses b. cats

c. owls

- A tarsier can turn its.... like owls.

  a. eyes   b. head

  d. tongue   c. tail

- ...and ......can't move their eye

  a. Owls and snakes   b. Tarsiers and owls

  d. Cats and tarsiers   c. Humans and cats

- polished mirror ....that fall on

  a. reflects some light rays

  b. reflects most light rays

  c. absorbs some light rays

  d. absorbs most light rays

- When the light of the sun falls on an opaque object, a/an........ is formed.

  (rainbow , dark shadow)

- All of these materials are opaque objects, **except**.

  a. wood b.lenses

  c.human body d. plastic

- Light travels in............

  a. curved b. zigzag c. straight

Give reason

- the fishing cat eyes seem to glow in the dark .
- candle is considered as a source of light.
- we can see the moon shining at night although it is not a source of light.

- nocturnal animals can see better than human at night
- Although tarsier and owl can't move their eyes, they can see surrounding objects in all directions.
- tarsier and owl have huge eyes.
- importance of tapetum lucidum for some nocturnal animals.
- the eyes of human do not glow like cats in the dark
- shadow of an opaque body is formed when light falls on
- you can see an object placed behind a glass cup.
- humans receive and send information through speaking , writing and reading.
- fireflies use different patterns of flash light to communicate with each other .

- fireflies produce a chemical reaction inside their bodies
- the songs of humpback whales have high-pitched sounds during winter months .
- a honeybee makes figure –eight pattern movement as away of communication with other bees.
- the nurse ants smelly massages to scout ants.
- the solider ants use smells in their communication.

- the echo that is picked up by the special cane of bind people is turned into vibrations.

What happened

- ✓ the smell sense of ants becomes weak .
- ✓ the amount of food in the ants colony decreases.
- ✓ there is a danger near to an ants colony.
- ✓ high-pitched sound that is produced by the blind person's cane hits an object.

✓ bats cannot use echolocation property.

✓ there is a wall in front of a blind person uses his special cane .

✓ light falls on a transparent body such as a glass window.

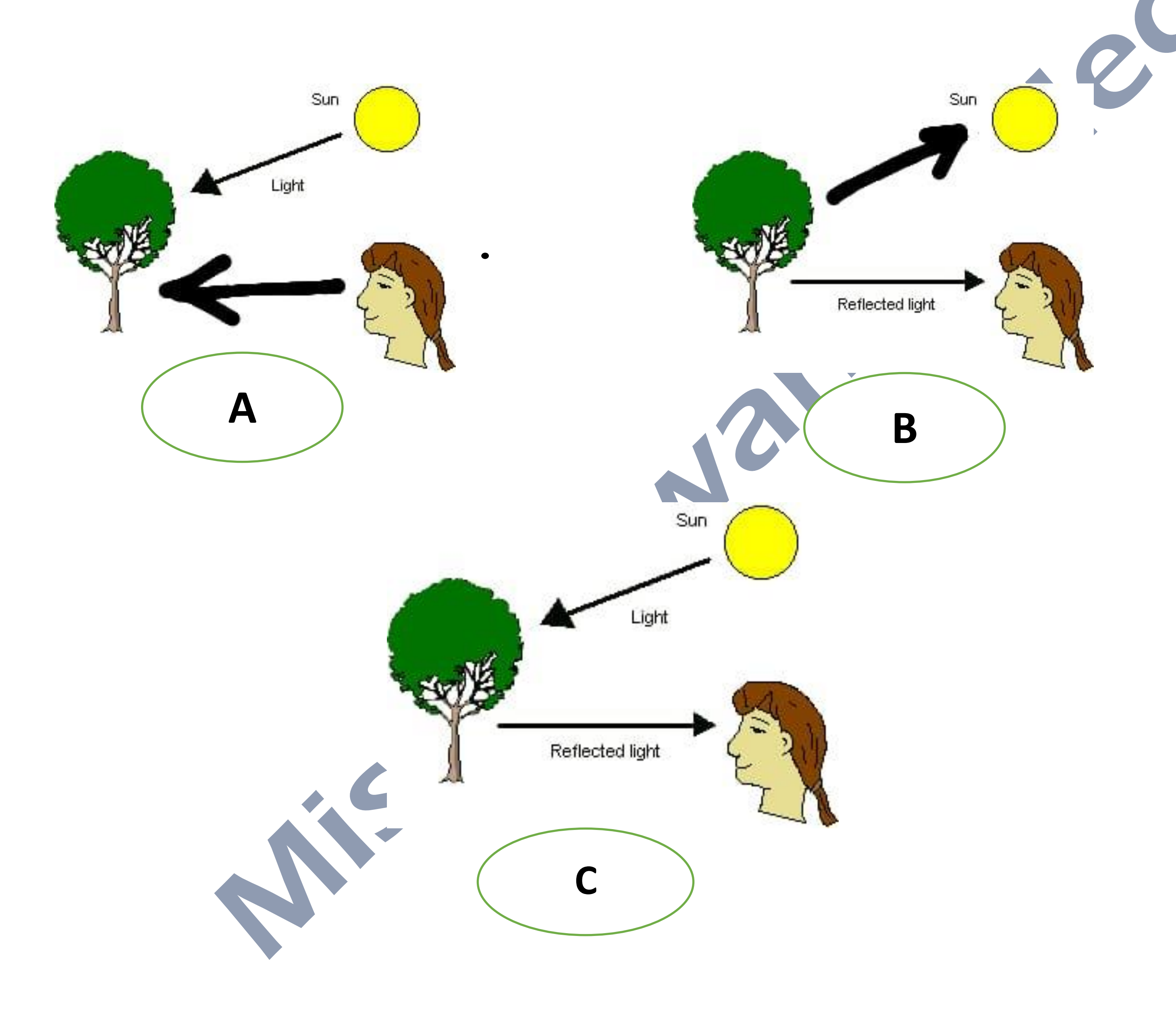
✓ light falls on a rough surface , (according to the direction of the reflected light.

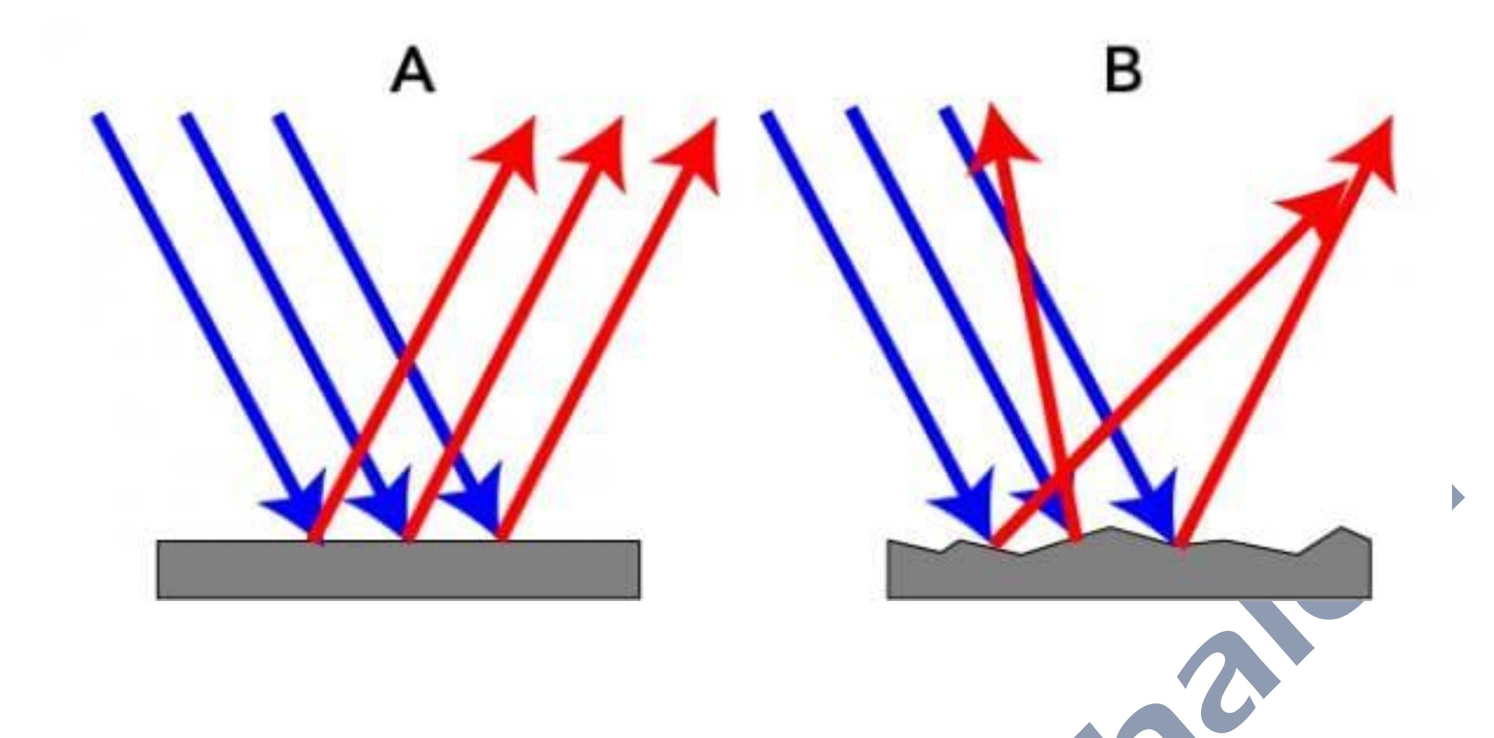
✓ a person makes flashing pattern by LED lights near to a group of fireflies

✓ the hearing sense of humpback whale becomes weak.

Look at picture and answer questions

Which of these following figures represent the correct vision in humans?





- figure a is ......surface

because light ray reflect..........direction

- figure b is .....surface

because light ray reflect..........direction

- Light is a form of energy that travels in ..... lines in the form of .....

Write the scientific term of each of the following:

- A living organism that can fly and depend on the echolocation property to get information about its surroundings in the dark. bat

- A simple tool (device) used by blind people to walk safely. special cane

- Honeybees which are responsible for searching out food resources. scout bee

- The sense by which bees receive movement codes that are sent by the scout honeybees

Sight

- Small living organisms that live in colonies and communicate with each other by smelly messages to perform different roles. ant

- A group of ants which is responsible for sending smelly messages when there is a shortage of food. Nurse ant

- A communication system developed by Samuel Morse in the 19th century. morse code

- The short beeps in Morse code. dots

- The long beeps in Morse code. dash

- A season in which the humpback whale produces high-pitched sound. winter

- A season in which the humpback whale produces low-pitched sound. summer

- Pitched sounds which travel through cold water better than through warm water .

High pitched sounds

- Pitched sounds which travel through warm water better than through cold water .

Low pitched sounds

- Sense organ that can detect sound energy. ear
- Sense organ that can detect light energy. eye
- It is a pattern that has meaning. code
- A kind of beetle that lights up its wings

Firefly beetles

- They can communicate by different languages
  human
- Energy that is used to communicate among humpback whales. sound energy
- Energy that is used to communicate among fireflies. light energy
- The way of communication among honeybees.
  dance
- The sense that helps honeybees to translate scout bee motion.
- The sense that helps ants to communicate .
  Sight
- Ants that are responsible for searching for food resources scout ant

- The sense used by the blind person to detect echo. touch
- The sense used by bats to detect echo and locate their prey. hearing
- They are things that give off their own light.
  Source of light
- .A life-saving structural adaptation that gives fishing cat excellent night vision.
  Tapetum lucidum
- They are objects that allow light to pass through.
  transparent
- It is a visible form of energy that travels straight line in the form of waves. Light



True or false

- The moon is considered one of the sources of light. f
- Fishing cats have a mirror-like membrane in front of their eyes. f
- Hunting at night for nocturnal animals is considered behavioral adaptation T

- Smooth materials reflect light more than rough materials. T

- Light waves travel in the air in the form of curved line F

- Tarsier eats insects, small lizards and small birds. T

- Tarsiers, fishing cats, humans and owls have an excellent night vision. F

- Panther chameleon eyes can move independently of each other, tarsier and owl eyes cannot move in their sockets. T

- Both of tarsier and fishing cat can turn their heads 180 degrees. T

- transparent material that allow light to pass through. T
- opaque material that don't allow light to pass through. T
- owl and tarsier are nocturnal animals that have excellent night vision T
- Humans and animals use light to communicate. T
- The wings of fireflies flash due to a physical reaction only inside their bodies. X
- Both humpback whales and Morse code can use sound energy in communication. T
- Firefly beetles and Morse code can use light energy in communication. T

- Morse code may use long and short flashes of light instead of long and short beeps. T
- Bees use flash light to communicate with each other. X
- Animals use technological systems as we do. X

- Bats make low-pitched sound and then listen for an echo. X
- special cane change the echo into vibrations. T
- Human can see in dim light X
- Tapetum lucidum is a structural adaptation in the human eyes. X
- Paper reflects more light than a mirror does. X
- The scout honeybee makes two round dance if the flower is very close X
- The scout honeybee performs a waggle dance in the direction right to left if the flower is far away T

- dancing bee moves in a figure-five pattern while vibrating its wings. X
- Groups of ants within a colony have similar roles.X

complete

- special cane can change echo to vibrations.
- The echo is turned into vibrations that a person can feel using his Thumb
- Short beeps in Morse code are represented by....dots
- long beeps in Morse code are represented by dash
- Men have a low-pitched sound pitched sound, while women have a high-pitched sound
- Humpback whales change their sound according to season

- high pitched sound transfers in cold water better than. Low pitched sound .
- Winter is considered the mating season for humpback whales while summer is feeding season

Choose

- All the following things are considered as light sources, **except**.

  a. the Sun. b. fire.

  c. eye. d. the light lamp.

- Which of the following organs are working together for seeing different objects...........?

  a. Nose and brain. b. Eyes and brain.

  c. Ears and brain. d. Tongue and brain.

- Both tarsier and owl

a. can swim .b.. belong to the same species

c. are nocturnal animals. d. can fly

- Humans have eyes… than nocturnal animals.

a. bigger c. stronger

b. smaller d. sharper

nocturnal animal have eyes… than Humans

a. bigger c. stronger

b. smaller d. sharper

- All the following materials are rough, **except**

a. cloth. b. mirror.

c. wood. d. paper.

- Which of the following objects is shiny and smooth?

a. Metallic spoon. D. Plastic spoon.
c. Wooden chair. B.T-shirt.

- ...are ......considered sources of light.

b. Lamps and mirrors a. Sun and moon
c. Fires and moon d. Flashlights and candles.

- ....and... are nocturnal animals that have poor night vision.

a. Owls and snakes b. Bats and cats
d. Bats and snakes c. fishing cat, Owl

- animals ......seem to glow in the dark.

a. owls c. bats
d. snakes b.fishing cat

- The eye is the sensory organ that is affected by the

a.heat b.Sight

c.sound d.Taste

- In complete darkness, many nocturnal animals can detect environment using all the following senses, except..

a.smell b.touch

b.hearing c. sight

- inside the eye is responsible allow more light

a. Cornea b. Lens

d. Pupil

- The pupils of nocturnal animals open.. ...than pupils of human

a. narrower b. wider c. similar

- The pupils of human open.. ...than pupils of nocturnal animals

b. narrower b. wider c. similar

- All these animals have tapetum lucidum in the back of their eyes except
  - a. deers d. horses b. cats
  - c. owls
- A tarsier can turn its.... like owls.
  - a. eyes b. head
  - d. tongue c. tail
- ...and ......can't move their eye
  - a. Owls and snakes b. Tarsiers and owls
  - d. Cats and tarsiers. c. Humans and cats
- polished mirror ....that fall on
  - a. reflects some light rays
  - b. reflects most light rays

c. absorbs some light rays

d. absorbs most light rays

- When the light of the sun falls on an opaque object, a/an........ is formed.

  (rainbow , dark shadow)

- All of these materials are opaque objects, **except**.

  a. wood b.lenses

  c.human body d. plastic

- Light travels in............

  a. curved b. zigzag c. straight

Give reason

- the fishing cat eyes seem to glow in the dark .
  Because it has a mirror-like membrane on the back of its eyes which bounces of the light.

- candle is considered as a source of light.
  Because it gives off their own light.

- we can see the moon shining at night although it is not a source of light.
  it reflects the sun light.

  nocturnal animals can see better than human at night
  Because nocturnal animals have bigger eyes which are more sensitive to light than humans and their pupils usually open wider than human.

- Although tarsier and owl can't move their eyes, they can see surrounding objects in all directions.
  Because they can turn their heads 180 **degrees**

- tarsier and owl have huge eyes.

  To collect more light

- importance of tapetum lucidum for some nocturnal animals.

  to collect more light .

- the eyes of human do not glow like cats in the dark

  . Because eyes of human don't contain tapetum lucidum

- shadow of an opaque body is formed when light falls on

  Because the opaque body doesn't allow light to pass through.

- you can see an object placed behind a glass cup.

  Because the glass cup is considered a transparent material which allows light to pass through .

- **humans receive and send information through speaking , writing and reading.**

To communicate with each other .

- **fireflies use different patterns of flash light to communicate with each other .**

To warm off their predators or to attract a mate.

- **fireflies produce a chemical reaction inside their bodies**

To light up their bodies.

- **the songs of humpback whales have high-pitched sounds during winter months .**

Because high -pitched sounds travel better through cold water .

- a honeybee makes figure -eight pattern movement as away of communication with other bees.

To communicate with other bees to find food and water resources.

- the nurse ants smelly massages to scout ants.

when food is low the nurse send smelly massage to

scout ant

- the solider ants use smells in their communication.

  To communicate with the other ants in case of danger

- the echo that is picked up by the special cane of bind people is turned into vibrations.

  To tell the blind person where object around him

What happened

✓ the smell sense of ants becomes weak .

  They cannot communicate with each other by smelly massage .

✓ the amount of food in the ants colony decreases.

  The nurse ants send smelly messages to scout ants to alert the ants where to find the food

✓ there is a danger near to an ants colony.

  The soldier ants send smelly messages to alert the other

ants that there is a danger nearly.

✓ high-pitched sound that is produced by the blind person's cane hits an object.

It bounces back to the cane in the form of echo which is turned into vibrations.

✓ bats cannot use echolocation property.

They cannot communicate with each other

✓ there is a wall in front of a blind person uses his special cane .

The cane will make vibrations that tell the blind person that there is a wall in front of him.

✓ light falls on a transparent body such as a glass window.

Light passes through the glass window.

✓ light falls on a rough surface , (according to the direction of the reflected light.

Light rays are reflected in different directions.

✓ a person makes flashing pattern by LED lights near to a group of fireflies

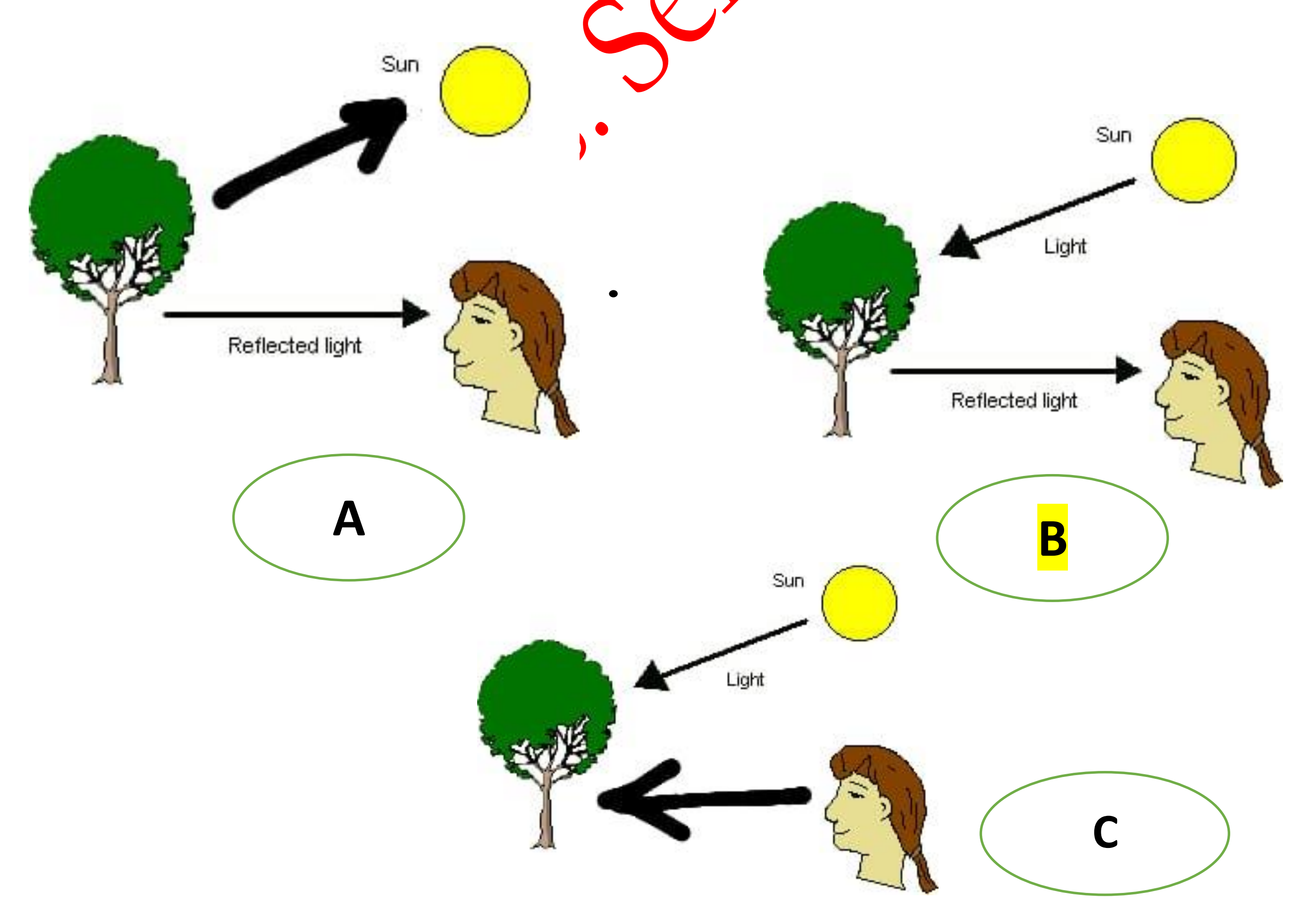
The fireflies responded the flashing pattern

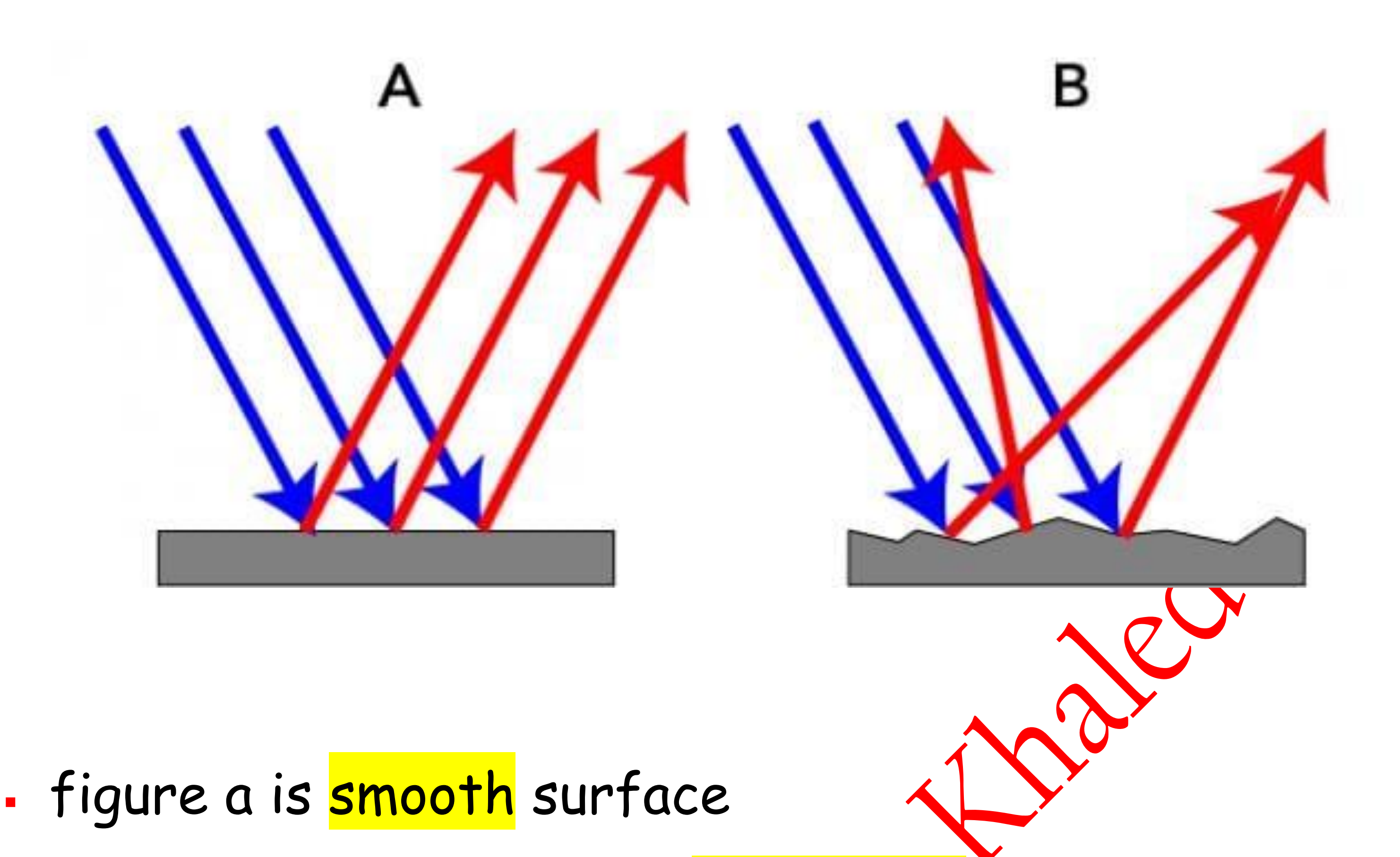
✓the hearing sense of humpback whale becomes weak.

They cannot communicate by songs using their hearing sense.

Look at picture and answer questions

Which of these following figures represent the correct vision in humans?





- figure a is smooth surface

because light ray reflect one (same)direction

- figure b is rough surface

because light ray reflect different direction

Light is a form of energy that travels in straight
- lines in the form of wave